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MATERNAL ANXIETY AND LEAD LEVELS IN CHILDREN

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ABSTRACT

There is a relationship between maternal anxiety and lead levels in children. Data were collected from the mothers of 15 children with "normal" lead levels and 15 children with elevated blood levels. Anxiety was measured by the Taylor Manifest Anxiety Scale. All families lived in areas with poor housing. There are significant policy implications in this study. Treatment of lead poisoning has tended to focus on the symptom alone. With lead poisoning and other diseases where family cooperation is important policy should expand medical treatment to include family support services. Greater attention needs to be paid to conditions such as lead poisoning, where the medical profession does not seem able or willing to set up appropriate conditions for treatment.

Maternal anxiety has been implicated as an important mechanism in children's emotional problems. This paper will present survey evidence which shows that maternal anxiety is also associated with physical illness; in this instance, lead poisoning in children. In turn, this data is used to suggest that health policy should make provision for family service where family cooperation is necessary to insure that illness is successfully prevented or treated.

Lead poisoning is a persistent and pernicious disease. In the second century B.C. Nicander described the illness among men who mined and refined lead. During this era Greeks and Romans used lead for many purposes, including cooking utensils.[1] Gilfullian has even suggested that lead poisoning may have contributed to Rome's fall. The wealthy used lead extensively. They also had many conditions associated with elevated lead levels; including high incidences of mental retardation, sterility, and infant mortality.[2] Whatever role lead played in Rome's demise it is clear that its dangers have been known since that time. That the disease has not been eradicated is a monument to man's capacity to trade lives for economic advantage.

Lead Poisoning as a Physical and Social Problem

The most poignant thing about lead poisoning is that even though the cause has been identified and appropriate legislation for control enacted it will still take more than a generation to eliminate the disease.[3] Some of this may be due to the time it takes to use up

existing stocks of paint, some may be due to the fact that ecomonic practicality dictates a long phaseout period for certain major sources of lead contamination such as gasoline and industrial discharges, and some because of lax or deliberate non-enforcement of existing laws. Passing laws is not enough; they must also be implemented. Not enforcing what is now on the books insures that widespread elevated blood levels in children will continue. This only illustrates an old truism: "When anything goes wrong Americans promptly pass a law and then forget it". Regardless of the reasons lead poisoning continues as a major killer or disabler of people. Children are more vulnerable to this disease than adults.[4]

Lead poisoning is a larger problem than most people, even those in the health professions, think it is. Rothschild has characterized it as a "silent epidemic".[5] Reed goes further and says it as a social crime.[6] Greer, summing up material from Senator Kennedy's 1970 hearings, and from other sources, notes that 200 children die every year from lead poisoning, 12,000 - 16,000 are treated, and as many as 400,000 children may be poisoned each year <u>without being detected</u>. About half of the children who receive treatment are left with significant mental deficits. This situation is compounded for the poor because old housing is a significant source of contamination. "The poisoning occurs in five to ten per cent of children between one and six years old who live in deteriorated areas".[7]

These data reflect findings and estimates at a time when the limit for a normal blood level was 40 micrograms per 100 milliliters of blood.[8] In 1975 the Center for Disease Control recommended that

the lower limit for undue lead absorption be set at 30 micrograms per 100 mililiters of blood because at that level "significant numbers of children .... have shown evidence of metabolic impairment".[9] With this as a standard it is probable that over a million children are affected every year by having more lead in their blood than they should have. While available estimates are not broken down in terms of incidence and prevalence there is sufficient evidence to suggest that every child in America who lives in an old house, close to heavy traffic and near industry is at risk for an elevated blood level if he doesn't already have one. This is true regardless of social class.

The Present Study*

The lead which is in the environment and which continues to be put there can only be dealt with by law, effective enforcement of the law and education. This will take a long time and requires a hard struggle. The danger can be gauged when companies like Standard Oil of California express concern over signigficant circumvention of recent legislation. They note that it is estimated that more than 10% of those who own cars requiring unleaded gasoline are using leaded gasoline even though there is a $10,000 federal fine for those caught doing this.[10] Social action to achieve environmental control must continue but it doesn't provide a point of intervention for those most immediately at risk.

*The data for this paper was collected by Barbara Mosher and is from her unpublished Master's thesis: The Relationship Between Anxiety Levels in Mothers and Blood-Lead Levels in Pre-School Children, Catholic University of America, 1975

The same can be said for the social factors associated with lead poisoning. Almost any epidemiological study or review of the literature shows that poverty and the conditions associated with it identify that portion of the population from which the bulk of childhood lead poisoning comes.[11] Efforts at reducing a level of poverty, which is worse than anywhere else in the so-called developed world, must continue; but that does not provide immediate help for children who are being denied the chance for a normal life.

Cultural factors have also been heavily implicated in the etiology of lead poisoning. Sometimes culture is only another way of describing the characteristics of poverty. Permissive or inconsistent socialization when children are in the oral period, which is prevalent among the poor, combines to create a style of life where the risk of lead poisoning is high.[12] It is possible to help families change their style of life, but not, in the short run, on a mass basis.

A factor which stands almost by itself is pica; the habitual ingestion of substances which are not food. It seems to be a combination of a cultural and an emotional pattern which is very powerful. Since it was first described in the sixth century pica has been reported many places in the world. What is most relevant here is that clay eating, a form of pica, was fairly widespread in Africa and came here with slavery.[13] While some direct clay eating still occurs the pattern has become fairly widely diffused in the form of starch eating. While little harm can come from eating a box of cornstarch, this behavior is potentially lethal when it is transferred to old wall plaster that has several coats of paint on it. Pica is not associated with any known dietary deficiency.[14] The extent

to which it is simply a continuation of a cultural pattern or reflects emotional difficulties in the family, as Lourie and his associates believe, it a moot point here.[15] While all children with pica do not get lead poisoning, a high proportion of children with lead poisoning have pica. All the evidence about pica reflects that once established it is a stubborn and ingrained pattern which is difficult to change.[16] To simply warn mothers to watch their children is ridiculous and to treat the child without regard to his environment is impossible.

One area where it is possible to intervene in conditions associated lead poisoning is the family. Chaiklin, et al. found that family functioning was related to recidivism in lead poisoning.[17] This is a particularly acute finding since a second episode of lead poisoning almost always causes at least some permanent brain damage. If services are provided to families through working with them, there is some hope that the environment can be altered. Certainly, it is difficult to accomplish any change if the family is not actively seeking it.

The present study carries the work on family diagnosis a step further by looking at a specific component in family diagnosis; namely, maternal anxiety. The reason for this is that investigators frequently note that mother of lead children are anxious but they have not examined the extent or the import of this factor.[18] Accordingly, the hypothesis for this study is that:

> Maternal anxiety is related to blood levels in children.

Procedure

Data was collected at two sources. Children with elevated lead levels were selected from the Lead Poison Screening Clinic at the John F. Kennedy Institute for the Habilitation of the Mentally and Physically Handicapped Child. The "normals" were selected from children attending Well Baby Clinic #12, a clinic known to serve a population living in what is known as a "lead belt"; an area with older housing and high levels of lead poisoning.

Thirty families were selected; 15 in the elevated group and 15 in the "normals". The selection method insured that both groups of families came from older sections of Baltimore and were of roughly comparable socioecomonic status. In both sets of families the index child had at least 50 micrograms of lead per 100 mililiters of blood and in the "normal" group each child had less than 40 micrograms of lead per 100 mililiters of blood. In each setting mothers were taken in order as they met the criteria. Procedures for informed consent were followed. All mothers asked participated in the study. In the "normal" group five mother had to be eliminated and replacements selected because their children had blood lead levels in excess of the minimum.

In order to provide optimum conditions for interviewing all data was collected from parents at home. Where children had high levels, data was collected after a two week period to allow for reduction in anxiety associated with diagnosis and to allow time for the first positive results of treatment to manifest themselves. During the interviewing, mothers were not only eager to talk but manifested a variety of needs where appropriate referral information was given.

The Taylor Manifest Anxiety Scale

The TMAS, without buffer items, was used to measure anxiety. Scores range from 0-50, low to high.[19] This scale has been extensively used. It consists of a series of simple true - false items. For example, "I do not have as many fears as my friends." Both the short form and the long form of the Taylor Scale have high reported reliability and validity.[20]

Findings

There is an association between maternal anxiety and children's lead levels. This is reflected in Table 1. The statistical significance of this association is overshadowed by the blood level in the so-called "normal" group. When this study was begun 40 micrograms per mililiter was considered to be the upper limit of the normal range. The later lowering of this limit to 30 micrograms means that all children in the "normal" group would now be considered at risk. One conclusion which can be drawn from this is that children who live in areas of older housing, heavy traffic, and close proximity to heavy industry cannot escape having pathological lead levels. There are so many ways of absorbing lead from the environment, including canned food - especially evaporated milk, that every environmental source of lead which can be controlled should be identified and acted on.[21]

TABLE 1

Maternal Anxiety and Children's Lead Levels

	Mean Lead Level	Mean TMAS
High Lead Group	59.7 mg/100 ml	27.4
"Normals"	26.6 mg/100 ml	16.4

n=30, t=4.7, P $<$ .001

TABLE 2

Comparison of Lead Group and "Normals"
Social Characteristics

	Lead Group	"Normals"
Child		
Average age	3.3	2.7
Percent black	87%	100%
Percent male	67%	73%
Mother		
Average age	26.3	24.9
Percent employed	27%	20%
Percent AFDC	60%	47%
Marital Status		
Intact Family	47%	40%
Separated-Divorced	13%	20%
Not Married	40%	40%
Family		
Average Number of Children	3.3	2.2
Average Family Size	5.5	4.1
Percent Adequate Housing	20%	53%
N=	15	15

The differences in anxiety levels for the two groups of mothers are not accounted for by differences in social characteristics presented

in Table 2. In the lead group the children and their mothers are somewhat older than in the non-lead group. It takes a while to acquire lead poisoning. This would account for the slightly larger family size in the lead group. The lead group reports more inadequacies in their housing but this may be due to their having been alerted to this by the diagnosis of lead poisoning in their children. Overall these families are struggling on the edge of poverty or they are in poverty.

Our interpretation regarding the situational nature of the anxiety experienced by lead mothers is paralleled by a sophisticated study of stress in the mothers of handicapped children by Bradshaw and Lawton. They concluded:

> that the level of stress in mothers with severely disabled children is much higher than in any "normal" sample of mothers; that little of the variation in the level of stress could be ascribed to the external social and physical conditions of the family; and that the provision of goods did not appear to have an impact on the level of mental well-being of mothers.[22]

In short, no known social or emotional variables, including the degree of handicap, explained the stress scores. Just having a handicapped child seemed a sufficient explanation of stress. Mothers of lead children bear the additional burden of knowing the disease was preventible and that a recurrence most certainly will bring retardation.

Discussion

The significantly higher anxiety scores of the lead mothers are interpreted as coming from the fact that they have received a diagnosis that their child had lead poisoning and that he was currently receiving

treatment for this disease. The similarity in social characteristics of the two groups of mothers suggests that in a couple of years the "normal" group will be no different than the lead group. To be poor, young, have little education and to have close contact with a threatening disease are all characteristics which predict anxiety.[23]

The whole process of diagnosis and treatment creates anxiety. The measure used in this study corroborates the clinical observations of anxiety. This anxiety tends to be situational. Even if it weren't the question remains; how do practitioners take account of this anxiety in planning and carrying out treatment. The medical treatment for the child is clear, routinized, and almost always successful, especially if the child is hospitalized. Bringing the disease under medical control is only part of the job. The child must be brought back for check-ups. Parents are frequently give injunctions to move. Given their limited finances they can only move to another old house. Recent evidence suggests that even when the lead is removed the residual dust in the house creates a threat. The parent can do nothing about lead from automobile and industrial sources. If the child has pica the parents are under even more pressure.

Given this set of conditions it is little wonder that clinical personnel often characterize such parents as uncooperative. What is strange in all this is that seldom is any provision made to give the parents the services that would enable them to cooperate in the treatment of their child. Clinics or hospitals set up to treat lead poisoning

in children seldom make provision for the diagnosis and treatment of lead poisoning from a family perspective. Since so many of these children have siblings this means that there is a good chance that the siblings will also get sick. In so far as we know no federal legislation which makes provision for the treatment of medical conditions also mandates services for family members who needs to cooperate in treating the condition. The lack of such services for lead poisoning is tragic.

Policy Recommendations

This study has demonstrated that maternal anxiety is associated with blood lead levels in children. We conclude that most of this anxiety is situational and comes from the impact of the diagnosis and subsequent treatment of the illness. Lead poisoning tends to be a disease of the poor. When it strikes the cooperation of parents is needed. It is suggested that future legislation for health services mandate provision of social services to the family where their cooperation in treatment is needed.

Finally, even though the sample in this study was small we suggest that further epidemiological studies of lead levels in the inner city are needed. It is probable that a significant share of what is now called "education disability" comes from lead levels that are dangerous but undetected. Children with grades not up to par and who are distractable and excitable are often labeled minimually brain damaged and put on tranquilizers almost indefinitely. The drugging of innocents is bad enough; but if it comes from misdiagnosis it is malpractice.

Needleman has said:

> Had thalidomide produced mental retardation rather than the characteristic deformity of phocomelia, it might still be sold and ingested in Europe and the United States. Minor degrees of perceptual and cognitive impairment, motor incoordination, and disturbances in attention can easily escape detection.
>
> The renewed controversy over race and intelligence generally has ignored this systematic distribution of lead among the urban poor; lead poisoning runs in families. [Italics Added][24]

All that we can add to this statement is that if lead poisoning runs in families then any program to prevent or cure this disease must take families into account. With something like lead poisoning to attempt to treat or prevent the disease by only working with the individual and not with the family is tantamount to insuring failure. As Robb said:

> One doesn't respond to administrative contact as an individual. The actual nature of his perception of, and responses to, the administrative process will be considerably affected by the structure of the family group to which he belongs.[25]

The concern with family services in preventing and treating lead poisoning in children must be comprehensive. While work remains to be done in charting the extent of undiagnosed low-level lead poisoning there needs to be no more demonstrating that families must be included in prevention and treatment. The Federal General Accounting Office has said, "it is futile to continue to sponsor new research without devoting attention to seeking use of valuable findings from past research".[26] Nowhere is this more true than in the need to provide family services for the prevention and treatment of lead poisoning in children. The Environmental Protection Agency is for the first time attempting to regulate the amount of lead released into the air

because, according to the administrator Douglas Costle, "We are finding that even low levels of lead may have more harmful and persistent effects than previously understood."[27] Without help families are helpless to fight the lead which floods in on them from all sides. To continue to treat the child victim of lead poisoning without helping the family to be a part of the struggle is an exercise in futility.

FOOTNOTES

[1]Paul B. Hammond, "Lead Poisoning, An Old Problem With A New Dimension," in Essays in Toxicology, ed. by Frank R. Blood (New York: Academic Press, 1969), pp. 116-117.

[2]S. C. Gilfullian, "Lead Poisoning and the Fall of Rome," Journal of Occupational Medicine, 7 (February, 1965), pp. 53-60.

[3]Lead has not been used in interior paint since 1950. The Lead-Based Paint Poisoning Prevention Act of 1971 banned the use of lead in any paint. In July 1976 the Department of Housing and Urban Development issued regulations requiring the elimination of lead-based paint hazards from HUD owned or assisted housing.

[4]Audun Attramadal and Jon Jonsen, "The Content of Lead, Cadmium, Zinc and Copper in Deciducus and Permanent Human Teeth," Acta Odontology Scandinavia, 34 (,1976), pp. 121-131.

[5]Edmund O. Rothschild, "Lead Poisoning - The Silent Epidemic," American England Journal of Medicine, 283 (September, 1970), pp. 704-705.

[6]Jane Reed, "Lead Poisoning-Silent Epidemic and Social Crime," American Journal of Nursing, 72 (September,1972), pp. 2181-2184.

[7]William F. Freer, Jr., "Lead Pain Poisoning - Municipal, State, and Federal Approaches," Urban Law Annual, 1974 (St. Louis: Washington University Press, 1974), p. 247.

[8]Jane S. Lin-Fu, "Undue Absorption of Lead Among Children," The New England Journal of Medicine, 286 (March, 1972), p. 705.

[9]U.S. Department of Health, Education and Welfare, Increased Lead Absorption and Lead Poisoning in Young Children (Atlanta: Center for Disease Control, 1975) p. 3

[10]"The Devil to Pay," Chevron World, LVII (Summer, 1978), p. 11

[11]J. Wister Meigs and Elaine, Whitmire, "Epidemiology of Lead Poisoning in New Haven Children - Operational Factors," Connecticut Medicine, 35 (June, 1971), pp. 363-369 and Jane S. Lin-Fu, Lead Poisoning in Children, U.S. Department of Health, Education and Welfare, Social and Rehabilitation Service, Children's Bureau Publication, 452 (Washington, D.C.: U.S. Government Printing Office, 1967).

[12]Pranab Chatterjee and Judith H. Gettman, "Lead Poisoning" Sub-culture as a Facilitating Agent," The American Journal of Clinical Nutrition, 25 (March, 1972), pp. 324-330.

[13]Marcia Cooper, Pica (Springfield, Illinois: Charles C. Thomas, 1957), pp. 3-44

[14]Margaret F. Gutelius, "Nutritional Studies of Children with Pica," Pediatrics, 29 (June, 1962), pp. 1012-1023.

FOOTNOTES CONTINUED

[15]Reginald S. Lourie, et al., "Why Children Eat Things That Are Not Food," Children, 10 (July - August, 1963), pp. 143-146; and Frances K. Millican et al., "Study of An Oral Fixation Pica," Journal of the American Academy of Child Psychiatry, 7 (January, 1968), pp. 79-109.

[16]Charles Baltimore and Roger Meyer, "A Study of Storage, Child Behavior Traits and Mother's Knowledge of Toxicology in 52 Poisoned Familes and 52 Comparison Families," Pediatrics, 42 (August, 1968), pp. 312-317.

[17]Harris Chaiklin, et al., "Recurrence of Lead Poisoning in Children," Social Work, 19 (March, 1974), pp. 196-200.

[18]Chaiklin, et al., p. 199; Raymond Sobel and James Margolis, "Repetitive Poisoning in Children - A Psychosocial Study," Pediatrics, 35 (April, 1965), pp. 641-651; Raymond Sobel, "The Psychiatric Implications of Accidental Poisoning in Children," Pediatric Clinics of North America, 17 (August, 1970), pp. 679, 683-684; J. Wister Meigs, "Can Occupational Health Concepts Help Us Deal With Childhood Lead Poisoning," American Journal of Public Health, 62 (November, 1972), pp. 1483-1484.

[19]Janet A. Taylor, "A Personality Scale of Manifest Anxiety," Journal of Abnormal and Social Psychology, 48 (April, 1953), pp. 285-290.

[20] Joyce B. McCreary and A. W. Bending, "Comparison of Two Forms of MAS," Journal of Consulting Psychology, XVII (June, 1954), p. 204; Donald P. Holt and Thomas M. Magon, "A Validation Study of the Taylor Manifest Anxiety Scale," Journal of Clinical Psychology, 10 (October, 1954), pp. 357-361; Edward Kendall, "The Validity of Taylor's Manifest Anxiety Scale," Journal of Consulting Psychology, XVIII (December, 1954), pp. 429-432; Arnold H. Buss et al., "The Measurement of Anxiety in Clinical Situations," Journal of Consulting Psychology, XIX (April, 1955), pp. 125-129; and Goldine Glaser and George Ulett, "The Saslow Screening Test As a Measure of Anxiety-Proneness," Journal of Clinical Psychology, 8 (July, 1952), pp. 279-283.

[21]Kevin P. Shea, "Canned Milk", Environment, 15 (March, 1973), pp. 6-8

[22]Jonathan Bradshaw and Dorothy Lawton, "Tracing the Causes of Stress in Families with Handicapped Children," British Journal of Social Work, 8 (Summer, 1978), p. 191.

[23]Gene N. Levine, "Anxiety About Illness "Psychology & Social Bases," Journal of Health and Human Behavior, III (Spring, 1962), pp. 30-34

[24]Herbert L. Needleman, "Lead Poisoning in Children - Neurologic Implications of Widespread Clinical Intoxiation," in Annual Progress in Child Psychiatry and Child Development 1974, ed. by Stella Chess and Alexander Thomas (New York: Brunner/Mazel Publishers, 1975), pp. 366-367.

[25]J.H. Robb, "Family Structure and Agency Coordination: Decentralization and the Citizen," in Social Welfare Institutions, ed. by Mayer N. Zald (New York: John Wiley and Sons, 1965), p. 386.

[26]General Accounting Office, Health Resources Division, Administration for Children, Youth and Families - Need to Better Use Its Research Results and Clarify Its Role, March 31, 1978 (Washington, D.C.: U.S. Government Printing Office, 1978), p. iii

FOOTNOTES CONTINUED

[27] The Baltimore Sun, September 30, 1978